PATENT APPLICATION

PATENT AND TRADEMARK OFFICE

BEFORE THE HONORABLE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Application of

Shigemi OHTSU et al.

On Appeal from Group: 1732

Application No.: 10/733,454

Examiner: M. VARGOT

Filed: December 12, 2003

Docket No.: 118039

For: PRODUCING METHOD OF POLYMER OPTICAL WAVEGUIDE

APPEAL BRIEF TRANSMITTAL

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Attached hereto is our Brief on Appeal in the above-identified application.

Also attached hereto is our Check No. 197511 in the amount of Five Hundred Ten Dollars ($510.00) in payment of the Brief fee under 37 C.F.R. 41.20((b)(2). In the event of any underpayment or overpayment, please debit or credit our Deposit Account No. 15-0461 as needed in order to effect proper filing of this Brief.

Respectfully submitted,

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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BRIEF ON APPEAL

Appeal from Group 1700

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I. REAL PARTY IN INTEREST

The real party in interest for this appeal and the present application is Fuji Xerox Co., Ltd., by way of an Assignment recorded in the U.S. Patent and Trademark Office at Reel 014569, Frames 0824-0825.

II. RELATED APPEALS AND INTERFERENCES

There are no prior or pending appeals, interferences or judicial proceedings, known to Appellants, Appellants' representative, or the Assignee, that may be related to, or that will directly affect or be directly affected by or have a bearing upon, the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1-19 are on appeal.

Claims 1-19 are pending.

No claims are allowed or otherwise indicated to contain allowable subject matter.

Claims 1-19 are rejected.

No claims are withdrawn from consideration.

No claims are canceled.

IV. STATUS OF AMENDMENTS

No Amendment After Final Rejection has been filed.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The subject matter of independent claim 1 relates to a method for producing a polymer optical waveguide comprising seven steps:

(1) preparing a template 20 that is made of a template forming curable resin and has a concave portion corresponding to an optical waveguide core convex portion (Figs. 1B-1C; page 12, line 12 to page 17, line 20; and page 28, line 20 to page 29, line 9 of the specification as filed);

(2) applying an ozone treatment or irradiating light having a wavelength of 300 nm or less to at least one of a surface of the template having the concave portion and a core formation surface of a cladding film substrate (page 17, line 21 to page 20, line 21; page 19, line 12 to page 20, line 18);

(3) bringing the cladding film substrate into close contact with the template (page 20, line 22 to page 23, line 12);

(4) filling a core forming curable resin into the concave portion of the template with which the cladding film substrate is in close contact (page 23, line 3 to page 25, line 13);

(5) curing the filled core forming curable resin to form a core (page 25, lines 14-18);

(6) removing the template from the cladding film substrate (page 25, lines 19 to page 26, line 5); and

(7) forming a cladding layer on the cladding film substrate on which the core has been formed (page 26, line 6 to page 28, line 8).

The subject matter of independent claim 19 is directed to a method for producing a polymer optical waveguide and comprises the first five steps of claim 1. Claim 19 additionally recites that the template is light transmissive, and a difference between a refractive index of the template and that of the core is 0.01 or more (page 25, line 25 to page 26, line 5).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The following grounds of rejection are presented for review:

Claims 1-19 are rejected under 35 U.S.C. 103(a) over U.S. Patent No. 6,355,198 to Kim et al. (Kim) in view of either Japanese Patent Publication No. 2002-365429 to Saiki et al. (Saiki) or Japanese Patent Publication No. 2002-146066 to Niino et al. (Niino).

The Office Action rejects claims 1-19 under the doctrine of obviousness-type double patenting over claims 1-18 of U.S. Patent No. 6,901,198 to Shimizu et al. (Shimizu '198) in view of either Saiki or Niino.

VII. ARGUMENT

As described in Appellants' application, prior to Appellants' invention, optical waveguides could be fabricated by a variety of processes such as the five processes listed at page 1, line 11 to page 2, line 3 of the specification as filed. However, these processes have various drawbacks such as high cost, making them non-ideal (page 2, lines 4-16). Newer methods for waveguide production include the use of a nano-structure that can be filled through capillary action by a liquid polymer (page 4, lines 6-16). However, because capillary action is slow, this method takes a long time and thus is not suitable for mass production (page 4, lines 20-25). Additionally, volume of the resulting waveguide can change when a monomer solution is substituted for the liquid polymer solution (page 4, line 25 to page 5 line 3). Reduction of the viscosity of the liquid monomer to increase filling rate results in an increase in the volume change between the filled waveguide template and the resulting cured waveguide core when the monomer is polymerized (page 5, lines 13-18).

Appellants have found that by applying an ozone treatment or an irradiating light having a wavelength of 300 nm or less to at least one of the template surface, formed of a curable resin, and the surface of the core formation surface of the cladding film substrate, many advantages result. These advantages include (1) that the adhesiveness of the surface of the cladding film substrate and/or the template surface that were ozone treated or irradiated is increased (page 18, lines 8-13); (2) films that were previously unusable as a cladding film substrate due to poor adhesiveness can be used if treated by the claimed ozone treatment or light irradiation (page 18, lines 13-16); (3) the wettability of the core forming resin on the template surface or cladding film substrate surface that is ozone treated or irradiated by light is increased; and (4) a greatly increased capillary action filling rate of the curable resin in the template or mold (page 18, lines 22-23), allowing mass production to be used.

Appellants have performed empirical tests showing that the claimed method greatly outperforms the prior state of the art. In example 1, the template surface and core formation surface of the cladding film substrate were subjected to light irradiation by a Xenon excimer lamp having a central wavelength of 172 nm for 5 minutes in air. The speed achieved by the subsequent filling of the mold by UV curable resin under vacuum-induced capillary action was 0.8 cm/min (page 40, lines 14-22). In the comparative example 1 prepared in the same manner as example 1 but lacking the light irradiation of the template and cladding film substrate surfaces, the filling speed of the UV curable resin was only 0.2 cm/min (page 44, lines 5-7). Under the conditions of example 3, again using light irradiation by a Xenon excimer lamp for five minutes, a UV curable resin filling rate of 1.5 cm/min was measured (page 42, lines 4-20). In comparative example 2, corresponding to example 3 but lacking the light irradiation of the template and cladding film substrate surfaces, the filling speed of the UV curable resin was only 0.2 cm/min (page 44, lines 10-13). Similarly, example 6 and comparative example 3 resulted in UV curable resin fill rates of 0.8 cm/min (page 43, line 24 to page 44, line 3) and 0.3 cm/min (page 44, lines 15-20), respectively. However, in the comparative example 3, the resulting core did not adhere to the cladding film substrate once the template was removed (id.).

The November 14, 2006 and April 30, 2007 Office Actions allege that the claimed subject matter is unpatentable over Kim in view of either Niino or Saiki and over Shimizu '198 claims 1-18 in view of either Saiki or Niino.

As discussed in the background of Appellants' specification, while Niino discloses use of short wavelength UV light to improve the hydrophilicity of the surface of fluoric-based polymer mold goods and Saiki discloses the use of UV light to improve the hydrophilicity of the surface of a protective film so that the film better adheres to a polarizer, neither Niino nor Saiki discloses or suggests the modification of Kim or Shimizu '198 claims 1-18 to irradiate

the surface of a cladding film substrate or template in order to improve the filling rate of a UV curable resin.

A. Claim 1 Is Patentable Over Kim In View Of Either Niino Or Saiki

1. Kim Fails To Disclose Applying An Ozone Treatment Or Irradiating Light Having A Wavelength Of 300 Nm Or Less

Regarding independent claim 1, Kim fails to disclose the step of "(2) applying an ozone treatment or irradiating light having a wavelength of 300 nm or less to at least one of a surface of the template having the concave portion and a core formation surface of a cladding film substrate.

Kim discloses a method of forming waveguides by micromolding. In the embodiment cited by the Office Action, article 20 (also called applicator 20) has indentations 24 which have rectangular cross-sections (Fig. 15). A fluid precursor 36 is first applied to applicator 20 to fill indentations 24 and the excess is scraped off (Fig. 15; col. 33, lines 2-5). Applicator 20, filled with the fluid precursor 36, then is placed on substrate 30 forming channels 32 (col. 33, lines 12-15). The applicator 20 can then be removed to leave the fluid precursor 36 behind on the substrate 30, after which it can be made dimensionally stable (col. 33, lines 15-17). Alternatively, the fluid precursor 36 can be made hard prior to removal of applicator 20 (col. 33, lines 17-20).

The Office Action admits that Kim fails to disclose step (2), but alleges that Saiki and Niino each cure this deficiency.

2. Niino Is Not Combinable With Kim

Niino discloses a method of modifying the surface of fluoric-based polymer mold goods by irradiation using a vacuum-ultraviolet laser having a wavelength of 157 nm under the presence of water or steam (paragraph [0006]). Niino discloses that the wavelength of 157 nm is specifically chosen to as to disassemble water molecules to generate sufficient active species to surface treat fluororesin (paragraph [0008]). The easy generation of the

active species results because water and steam are highly absorbing of energy at 157 nm (paragraph [0008]) and break into reaction intermediaries such as a hydrogen atom and a hydroxyl-group radical (paragraph [0007]). The resulting hydrogen atoms and hydroxyl-group radicals interact with the mold goods surface molecules to produce surface hydrophilization (paragraph [0007]).

One of ordinary skill in the art would not have been motivated to modify the disclosure of Kim by adding the irradiation step of Niino because: (1) the disclosures of Kim and Niino are not technically compatible; and (2) neither Kim nor Niino discloses that the disclosure of Kim has a problem with hydrophilicity. Further, (3) adding the irradiation step of Niino to the disclosure of Kim would render the disclosure of Niino unsuitable for its intended purpose; and (4) the modification of the disclosure of Kim with that of Niino is improper because it uses impermissible hindsight.

The disclosures of Kim and Niino are incompatible because Kim fails to disclose that substrate 30 is fluorine-based. In fact, Kim teaches away from such a material, stating that suitable materials for substrate 30 include gold, glass, and silicon (col. 35, lines 31-34). One of ordinary skill in the art would not have been motivated to add the irradiation step of Niino to the disclosure of Kim because it does not make technical sense. The purpose of Niino's use of a 157 nm excitation wavelength is because both the fluororesin of Niino's mold goods and the water and steam surrounding the mold goods absorb at this wavelength to produce the necessary reaction components that enable the surface hydrophilization to occur. Because the disclosure of Kim indicates that substrate 30 is not a fluororesin and that water and steam are not present during the article/waveguide forming process, there is no technical reason to add the irradiation step of Niino to the disclosure of Kim as proposed by the Office Action.

One of ordinary skill in the art also would not have been motivated to add the irradiation step of Niino to the disclosure of Kim because Kim does not have a problem that

the addition of the irradiation step of Niino would address. Neither Kim nor Niino discloses that the article/waveguide forming process of Kim suffers from a problem of having too little hydrophilicity regarding the adhesion of fluid precursor 36 to substrate 30. While the November 14, 2006 Office Action cites to Kim at col. 21, line 13 as indicating "that a hydrophilic surface would be encompassed within the invention," Kim also, within the same citation, indicates that other types of materials, including hydrophobic materials, are suitable. Indeed, Kim recognizes hydrophilic problems in other areas, such as regarding the attachment of a cladding layer 170 to waveguides 38 once the waveguides 38 have been formed (see paragraph beginning at col. 34, line 33). Thus, the absence of any disclosure by Kim of a hydrophilic problem regarding the adhesion of fluid precursor 36 to substrate 30 implies that such a problem does not exist. Because the disclosure of Kim implicitly indicates that there is no problem with hydrophilicity of substrate 30, there is no technical reason to add the irradiation step of Niino to the disclosure of Kim as proposed by the Office Action.

The proposed combination of Kim and Niino is improper because adding the irradiation step of Niino to the disclosure of Kim would render the disclosure of Niino unsuitable for its intended purpose. As discussed above, Kim fails to disclose that substrate 30 can be made of a fluororesin or that the article/waveguide forming process utilizes water or steam. Without even one of the fluororesin or water and steam components, the irradiation step of Niino cannot induce the intended hydrophilization of a fluororesin surface. Thus, adding the irradiation step of Niino to the article/waveguide forming process of Kim necessarily renders the disclosure of Niino unsuitable for its intended purpose in violation of MPEP §2143.01(V) and is thus improper.

Further, the modification of the disclosure of Kim with that of Niino is improper because it uses impermissible hindsight. The Office Action states that it would have been obvious to combine the disclosure of Niino with that of Kim to improve the hydrophilicity of

a polymeric surface "as noted by Applicant" (November 14, 2006 Office Action, page 2). Thus, the Patent Office has impermissibly relied on Appellants' disclosure to provide the motivation to combine.

Additionally, Niino is directed to a method of increasing hydrophilicity of a surface under a process that requires water or steam, whereas the claimed subject matter is a process which benefits from the presence of ozone or air from which ozone is produced. Thus, even if the disclosure of Niino is combined with that of Kim, the resultant combination would not correspond to the claimed subject matter.

For the forgoing reasons, the Patent Office's proposed combination of the disclosures of Kim and Niino is improper.

3. Saiki Is Not Combinable With Kim

Saiki discloses production of a transparent protection film 3 for a polarizer 1 for use in a liquid crystal display (paragraph [0002]). The transparent protection film 3 can be a cellulose type polymer, but preferably is triacetyl cellulose (TAC) (paragraph [0019]). The hydrophilic nature of a processing surface "a" of the transparent protection film 3 is increased by ultraviolet irradiation (drawing 2; paragraphs [0014] and [0022]). After exposure of transparent protection film 3, a glue line 2 of a polyvinyl alcohol system adhesive is applied and the transparent protection film 3 is joined to the polarizer 1 (paragraph [0062]).

One of ordinary skill in the art would not have been motivated to combine the UV irradiation step of Saiki with the disclosure of Kim because (1) neither Kim nor Saiki discloses or suggests that Kim has a problem with hydrophilicity that would be benefited by the modification of the method of Kim by that of Saiki; and (2) there is no motivation to combine the disclosures of Kim and Saiki. Further, (3) the modification of the disclosure of Kim with that of Saiki is improper because it uses impermissible hindsight.

Neither Kim nor Saiki discloses that Kim has a problem with hydrophilicity regarding the adhesion of fluid precursor 36 to substrate 30. Thus, one of ordinary skill in the art would understand, from the applied references taken as a whole, that no benefit would be derived from increasing the hydrophilicity of the surface of either applicator 20 or substrate 30.

Further, Saiki is directed to increasing the hydrophilic nature of the surface of a transparent protective film 3, preferably made of triacetyl cellulose, in order to apply a glue line 2 (adhesive) in order to join the transparent protective film 3 with a polarizer 1 to produce a polarizer plate. In contrast, Kim is directed to forming structures 38 by filling an applicator 20 with a fluid precursor 36 which is then applied to a substrate 30. Thus, Kim and Saiki address divergent technologies and lack any motivation or suggestion to combine them as asserted by the Office Action.

Further, the modification of the disclosure of Kim with that of Saiki is improper because it uses impermissible hindsight. The Office Action states that it would have been obvious to combine the disclosure of Saiki with that of Kim to improve the hydrophilicity of a polymeric surface "as noted by Applicant" (November 14, 2006 Office Action, page 2). Thus, the Patent Office has impermissibly relied on Appellants' disclosure to provide the motivation to combine.

For the forgoing reasons, the Patent Office's proposed combination of the disclosures of Kim and Saiki is improper.

B. Claim 19 Is Patentable Over Kim In View Of Either Niino Or Saiki

Regarding independent claim 19, Kim fails to disclose (i) the step of "(2) applying an ozone treatment or irradiating light having a wavelength of 300 nm or less to at least one of a surface of the template having the concave portion and a core formation surface of a cladding film substrate; and (ii) "wherein the template is light transmissive, and a difference between a refractive index of the template and that of the core is 0.01 or more."

Regarding feature (i) above, claim 19 step (2) is identical to claim 1 step (2). Thus, claim 19 is patentable over the applied references for the same reasons as stated in relation to the rejection of claim 1.

Kim fails to disclose feature (ii) above wherein the template is light transmissive and a difference between a refractive index of the template and that of the core is 0.01 or more. While Kim discloses that a template can be "transparent to radiation," Kim discloses this in relation to curing the fluid precursor 36 (col. 11, lines 42-44). Kim is silent as to any relationship between the refractive indices of the applicator 20 and the resulting structure 38. Further, Kim has no reason to discuss the relative refractive indices of the applicator 20 and the resulting structure 38 because Kim does not disclose or suggest the retainment of the applicator 20 as a cladding layer. Further, even if the proposed combination of Kim and Niino is deemed proper, Niino fails to cure the deficiency of Kim.

In contrast, as disclosed in embodiments, Appellants' template can be retained as a cladding layer (page 25, line 25 to page 26, line 5). The difference in refractive indices between the template and the core thus improves performance of the core as an optical waveguide.

C. Independent Claims 1 And 19 Are Patentable Over Shimizu '198 Claims 1-18 In View Of Either Saiki Or Niino

1. Niino Is Not Combinable With Shimizu '198

Shimizu '198 claims a process for producing a polymer optical waveguide having the steps of preparing a mold having concave portions; bringing a cladding substrate into contact with the mold; and filling the concave portions with a curable resin (claim 1). Shimizu '198 fails to claim (or disclose) a step of applying an ozone treatment or irradiating light having a wavelength of 300 nm or less to at least one of a surface of a template or a cladding film portion as recited in Appellants' claims 1-19.

Regarding independent claims 1 and 19, one of ordinary skill in the art would not have been motivated to modify the claims or disclosure of Shimizu '198 by adding the irradiation step of Niino because: (1) the disclosures of Shimizu '198 and Niino are not technically compatible; (2) neither Shimizu '198 nor Niino discloses that Shimizu '198 has a problem with hydrophilicity; and (3) there is no motivation to combine when the references are taken as a whole. Further, (4) adding the irradiation step of Niino to Shimizu '198 would render the disclosure of Niino unsuitable for its intended purpose; and (5) the modification of Shimizu '198 with that of Niino is improper because it uses impermissible hindsight.

One of ordinary skill in the art would not have been motivated to add the irradiation step of Niino to Shimizu '198 because it does not make technical sense. The purpose of Niino's use of a 157 nm excitation wavelength is because both the fluororesin of Niino's mold goods and the water and steam surrounding the mold goods absorb at this wavelength to produce the necessary reaction components that enables the surface hydrophilization to occur. Because Shimizu '198 indicates that water and steam are not present during the core 2 forming process, there is no technical reason to add the irradiation step of Niino to Shimizu '198 as proposed by the Office Action.

One of ordinary skill in the art would further not have been motivated to add the irradiation step of Niino to Shimizu '198 because Shimizu '198 does not have a problem that the addition of the irradiation step of Niino would address. Neither Shimizu '198 nor Niino discloses that the waveguide forming process of Shimizu '198 suffers from a problem of having too little hydrophilicity regarding the adhesion of the curable resin to the cladding substrate. Because Shimizu '198 indicates that there is no problem with a lack of surface hydrophilicity, there is no technical reason to add the irradiation step of Niino to Shimizu '198 as proposed by the Office Action.

The alleged combination of Shimizu '198 and Niino is further improper because adding the irradiation step of Niino to Shimizu '198 would render the disclosure of Niino unsuitable for its intended purpose. As discussed above, Shimizu '198 fails to disclose that the waveguide forming process utilizes water or steam. Without even one of the fluororesin or water and steam components, the irradiation step of Niino cannot induce the intended hydrophilization of a fluororesin surface. Thus, adding the irradiation step of Niino to the waveguide forming process of Shimizu '198 necessarily renders the disclosure of Niino unsuitable for its intended purpose in violation of MPEP §2143.01(V) and is thus improper.

Further, the modification of Shimizu '198 with that of Niino is improper because it uses impermissible hindsight. The November 14, 2006 Office Action states that it would have been obvious to combine the disclosure of Niino with Shimizu '198 to "render the surface more hydrophilic" (November 14, 2006 Office Action, page 6). Given that there is no disclosure or suggestion that the cladding substrate or mold of Shimizu '198 has insufficient hydrophilicity, the Patent Office has impermissibly relied on Appellants' disclosure to provide the motivation to combine.

For the forgoing reasons, the Patent Office's proposed combination of Shimizu '198 and Niino is improper.

2. <u>Saiki Is Not Combinable With Shimizu '198</u>

Regarding independent claims 1 and 19, one of ordinary skill in the art would not have been motivated to combine the UV irradiation step of Saiki with the claims of Shimizu '198 because (1) neither Shimizu '198 nor Saiki disclose or suggest that Shimizu '198 has a problem with hydrophilicity that would be addressed by the modification of the method of Shimizu '198 by that of Saiki; and (2) there is no motivation to combine Shimizu '198 and Saiki. Further, (3) the modification of Shimizu '198 with Saiki is improper because it uses impermissible hindsight.

Neither Shimizu '198 nor Saiki discloses that of Shimizu '198 has a problem with hydrophilicity regarding the adhesion of the curable resin to the cladding substrate. Thus, one of ordinary skill in the art would understand, from the applied references taken as a whole, that no benefit would be derived from increasing the hydrophilicity of the surface of either Shimizu '198's mold or cladding substrate.

Further, Saiki is directed to increasing the hydrophilic nature of the surface of a transparent protective film 3, preferably made of triacetyl cellulose, in order to apply a glue line 2 (adhesive) in order to join the transparent protective film 3 with a polarizer 1 to produce a polarizer plate. In contrast, Shimizu '198 is directed to forming structures 38 by filling an applicator 20 with a fluid precursor 36 which is then applied to a substrate 30. Thus, Shimizu '198 and Saiki address divergent technologies and lack any motivation or suggestion to combine the references as asserted by the Office Action.

Further, the modification of Shimizu '198 with that of Saiki is improper because it uses impermissible hindsight. The Office Action states that it would have been obvious to combine Saiki with Shimizu '198 to "render the surface more hydrophilic" (November 14, 2006 Office Action, page 6). Given that there is no disclosure or suggestion that the cladding substrate or mold of Shimizu '198 has insufficient hydrophilicity, the Patent Office has impermissibly relied on Appellants' disclosure to provide the motivation to combine.

For the forgoing reasons, the Patent Office's proposed combination of Shimizu '198 and Saiki is improper.

VIII. CONCLUSION

For all of the reasons discussed above, it is respectfully submitted that the rejections are in error and that claims 1-19 are in condition for allowance. For all of the above reasons, Appellants respectfully request this Honorable Board to reverse the rejections of claims 1-19.

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APPENDIX A - CLAIMS APPENDIX

CLAIMS INVOLVED IN THE APPEAL:

1. A method for producing a polymer optical waveguide comprising the steps of:

(1) preparing a template that is made of a template forming curable resin and has a concave portion corresponding to an optical waveguide core convex portion;

(2) applying an ozone treatment or irradiating light having a wavelength of 300 nm or less to at least one of a surface of the template having the concave portion and a core formation surface of a cladding film substrate;

(3) bringing the cladding film substrate into close contact with the template;

(4) filling a core forming curable resin into the concave portion of the template with which the cladding film substrate is in close contact;

(5) curing the filled core forming curable resin to form a core;

(6) removing the template from the cladding film substrate; and

(7) forming a cladding layer on the cladding film substrate on which the core has been formed.

2. The method of claim 1, wherein the light having a wavelength of 300 nm or less is irradiated by an excimer radiation source.

3. The method of claim 2, wherein the excimer radiation source is a dielectric barrier discharge excimer radiation source having a central emission wavelength of 172 nm.

4. The method of claim 1, wherein the template forming curable resin is liquid silicone rubber.

5. The method of claim 4, wherein the liquid silicone rubber is liquid dimethyl siloxane rubber.

6. The method of claim 1, wherein the core forming curable resin is an acrylic UV curable resin.

7. The method of claim 1, wherein the core forming curable resin is an epoxy UV curable resin.

8. The method of claim 1, wherein a refractive index of the cladding film substrate is 1.55 or less.

9. The method of claim 1, wherein the cladding film substrate is an alicyclic acrylic resin film.

10. The method of claim 1, wherein the cladding film substrate is an alicyclic olefinic resin film.

11. The method of claim 10, wherein the alicyclic olefinic resin film is a resin film having a norbornene structure on a main chain and a polar group on a side chain.

12. The method of claim 1, wherein a surface energy of the template is in a range of 10 to 30 dyn/cm.

13. The method of claim 1, wherein a Share rubber hardness of the template is in a range of 15 to 80.

14. The method of claim 1, wherein a surface roughness of the template is 0.2 μm or less.

15. The method of claim 1, wherein the template is light transmissive in at least one of a UV region and a visible region.

16. The method of claim 1, wherein a volume change when the core forming curable resin is cured is 10% or less.

17. The method of claim 1, wherein difference between a refractive index of the cladding film substrate and that of the cladding layer is 0.05 or less.

18. The method of claim 1, wherein a refractive index of the core is 1.50 or greater.

19. A method for producing a polymer optical waveguide comprising the steps of:

(1) preparing a template that is made of a template forming curable resin and has a concave portion corresponding to an optical waveguide core convex portion;

(2) applying an ozone treatment or irradiating light having a wavelength of 300 nm or less to at least one of a surface of the template having the concave portion and a core formation surface of a cladding film substrate;

(3) bringing the cladding film substrate into close contact with the template;

(4) filling a core forming curable resin into the concave portion of the template with which the cladding film substrate is in close contact; and

(5) curing the filled core forming curable resin to form a core,

wherein the template is light transmissive, and a difference between a refractive index of the template and that of the core is 0.01 or more.

APPENDIX B - EVIDENCE APPENDIX

NONE

APPENDIX C - RELATED PROCEEDINGS APPENDIX

NONE